

Guidance for Requesting Ground Water Quality Point(s) of Compliance at New Mines or Mine Expansions



**State of Idaho
Department of Environmental Quality**

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Cover photo of Blackfoot Bridge Mine, Caribou County Idaho, provided by P4 Production, LLC.

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Acronyms and Abbreviations

BMP	best management practice
BPM	best practical method
DEQ	Idaho Department of Environmental Quality
IDAPA	refers to citations of Idaho administrative rules
IDWR	Idaho Department of Water Resources
IDL	Idaho Department of Lands
ISDA	Idaho State Department of Agriculture
POC	point of compliance
USGS	United States Geological Survey

Executive Summary

The purpose of this guidance is to assist mine operators in developing an appropriate level of detail when applying to the Idaho Department of Environmental Quality (DEQ) for a point of compliance determination. The guidance also outlines procedures for DEQ staff to follow when reviewing the application and determining the point of compliance. This guidance is not a rule or rulemaking.

The Idaho “Ground Water Quality Rule” (IDAPA 58.01.11) was revised in 2009 to clarify language and promote consistency in the application of the rule to mining activities. Temporary and proposed rulemaking was conducted in 2015 to ensure the rule was consistent with a 2015 revision to Idaho Code §39-102 enacted under House Bill 197. The revised rule clarifies that degradation of ground water caused by mining activities is allowed at a point of compliance as long as the mine operator uses best management practices to the maximum extent practical. The rule also does the following:

- Addresses only those contaminants that naturally occur in the mining area ground water or in the surrounding rock or soil and are present at concentrations above the natural background level as a result of mining activities
- Applies only to new mining activities or an expansion of existing mining activities commencing after July 1, 2009
- Requires a \$2,500 fee to accompany the application
- Limits the determination process to 180 days upon receipt of a complete application
- Identifies specific information that must be provided by the applicant
- Requires ground water monitoring and reporting
- Sets conditions to change point(s) of compliance and ground water monitoring once set

It is important for mine operators to submit an appropriate level of information demonstrating that current and projected beneficial uses of ground water will be protected consistent with the applicable sections in the rule.

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1 Purpose

The purpose of this guidance is to describe the application process and elements that must be provided in sufficient detail when requesting the Idaho Department of Environmental Quality (DEQ) set point(s) of compliance (POC) for mining operations. A POC is the vertical surface at which Idaho's ground water quality standards must be met. The Idaho "Ground Water Quality Rule" (IDAPA 58.01.11) requires that mine operators protect current and projected beneficial uses of ground water and meet ground water quality standards as described in subsection 200 or as allowed under subsection 400.05 at the POC. Ground water degradation is allowed inside the POC for naturally occurring contaminants. Ground water degradation of naturally occurring contaminants may exceed the ground water quality standards inside the POC as long as best management practices (BMPs) are applied to the maximum extent practical. Ground water quality standards must be met at and outside of the POC. The rule requires the POC be set as close as possible to the boundary of the mining area as defined by DEQ, but in no event can the POC be set within the mining area boundary. If a POC request is not made, then the mine operator must meet ground water quality standards both within and beyond the mining area.

This guidance details the information DEQ will review to determine if an application is sufficient to set the POC. This guidance is also a resource to further interpret additional components within the rule, particularly the ground water quality monitoring and reporting system. This guidance is not a rule or rulemaking.

2 Introduction

Mining activities must comply with state policy, including the "State Policy on Environmental Protection" (Idaho Code §39-102), "Idaho Ground Water Quality Protection Act" (Idaho Code §39-120(1)), and *Idaho Ground Water Quality Plan* (Ground Water Quality Council 1996).

This document will help mine operators comply with the legislative mandates and DEQ rules. This guidance follows the general structure of IDAPA 58.01.11.401 and is separated into the following sections:

- *Statement of Authority* (section 3) describes the statutes and rules that apply to mining projects.
- *Application Process Overview* (section 4) lists a general sequence of steps/actions taken by the applicant and/or DEQ as the POC determination is developed.
- *Preproject Planning Meeting* (section 5) explains the purpose of the planning meeting and provides regional office contact information.
- *Data Collection and Analysis* (section 6) explains the information the mine operator should collect and the necessary analysis needed prior to submitting the POC application to DEQ.
- *Point of Compliance Application Information* (section 7) provides the required elements for a POC determination.
- *Application Review and Determination* (section 8) describes the information necessary for DEQ to analyze the application and set the POC locations where ground water quality standards must be met.

- *Ground Water Monitoring and Reporting* (section 9) describes the ground water monitoring and reporting required under the rule once a POC determination has been made by DEQ.
- *Change in Points of Compliance/Ground Water Monitoring* (section 10) describes the steps necessary for the operator or DEQ to follow to change the POC or ground water monitoring.

3 Statement of Authority

DEQ authority is defined in multiple places, as described below.

3.1 Idaho Ground Water Quality Protection Act

The “Idaho Ground Water Quality Protection Act” (Idaho Code §39-120) was enacted to include the State Policy on Environmental Protection, which states “it is the policy of the state to prevent contamination of ground water from any source to the maximum extent practical” (Idaho Code §39-102(3)(a)) and “all persons in the state should conduct their activities so as to prevent the nonregulated release of contaminants into ground water” (Idaho Code §39-102(3)(c)).

Idaho’s policy regarding mining and ground water quality, Idaho Code 39-102(4), states the following:

It is the policy of the state to protect ground water and to allow for the extraction of minerals above and within ground water. A mine operator shall protect current and projected future beneficial uses of ground water at a point of compliance designated pursuant to rule of the department. Degradation of ground water is allowed at a point of compliance if the mine operator implements the level of protection during mining activities appropriate for the aquifer category.

The act also defined agency responsibilities (Idaho Code §39-120) and designated DEQ as the primary agency to coordinate and administer ground water quality protection programs for the state. **Error! Hyperlink reference not valid.**

3.2 Idaho Ground Water Quality Plan

The act provided for the development of an *Idaho Ground Water Quality Plan*, which was approved by the Idaho Legislature in 1992 and later revised in 1996 to include the Agricultural Ground Water Quality Protection Program for Idaho.

Ground Water Protection Policy I-B of the plan states “the policy of the state of Idaho is that existing and projected future beneficial uses of ground water shall be maintained and protected, and degradation that would impair existing and projected future beneficial uses of ground water and interconnected surface water shall not be allowed.” In part, the intent of Ground Water Protection Policy I-B is to “ensure that the quality of ground water that discharges to surface water does not impair identified beneficial uses of the surface water.”

Ground Water Quality Prevention Policy II-C of the plan states the following:

The policy of the state of Idaho is to protect ground water and allow for the extraction of minerals above and within ground water...Mining, by its very nature, may use ground water and impact ground water quality in a localized area. The localized contamination may result in some ground water being unavailable

for other beneficial uses at that specific site...Ground water and minerals are both vital to our lives. It is the intent of this Ground Water Quality Plan to strike a balance between these two resources. The Ground Water Quality Plan directs the Department, in cooperation with other appropriate agencies, to develop guidelines, management practices, and rules to ensure that mining projects comply with the *Ground Water Quality Plan*. (1992, Amended 1996)

3.3 Idaho Ground Water Quality Rule (IDAPA 58.01.11)

The Idaho Ground Water Quality Rule section 401, “Mining,” authorizes DEQ to establish POCs that will allow mining while ensuring there is no injury to current or projected future beneficial uses of ground water outside the mining area and no violation of surface water quality standards to any interconnected surface water. At the same time “Degradation of ground water is allowed at a point of compliance if the mine operator implements the level of protection during mining activities appropriate for the aquifer category as specified in Table 1 of Subsection 150.02. Furthermore, the rule states that DEQ shall require ground water monitoring that represents background ground water quality and the ground water quality passing through the POC(s) to determine compliance with ground water quality standards and/or effectiveness of BMPs. In some cases, mine operators may be required to submit for DEQ’s review and approval a work plan for determining the baseline/background concentration of their mine site.

3.4 Other Idaho Authorities

If cyanide is used to extract minerals, the mine operation also must comply with IDAPA 58.01.13, “Rules for Ore Processing by Cyanidation.”

All monitoring wells required under a POC determination are subject to Idaho Department of Water Resources (IDWR) “Well Construction Standards Rules,” IDAPA 37.03.09.

Surface mining in Idaho must comply with the Idaho Department of Lands (IDL) “Rules Governing Exploration, Surface Mining, and Closure of Cyanidation Facilities,” IDAPA 20.03.02.

3.5 Guidance Documents

The following are additional guidance documents for use in determining POCs and monitoring requirements:

- *Best Management Practices for Mining in Idaho* (IDL 1992)
- *Catalog of Stormwater Best Management Practices for Cities and Counties*—
www.deq.idaho.gov/water-quality/wastewater/stormwater
- *Statistical Guidance for Determining Background Ground Water Quality and Degradation* (DEQ 2014)
- *Compendium of Best Management Practices to Control Polluted Runoff*—
www.deq.idaho.gov/media/458917-compendium_report_2003_entire.pdf
- *National Field Manual for the Collection of Water Quality Data* (USGS 2015)

4 Application Process Overview

This section provides a general sequence of steps to be taken by the applicant in completing a POC application and by DEQ in reviewing the application and developing a POC determination. Figure 1 outlines this process. The following sections define and more fully explain each step. Green boxes are steps to be completed by the applicant and blue boxes are actions to be taken by DEQ.

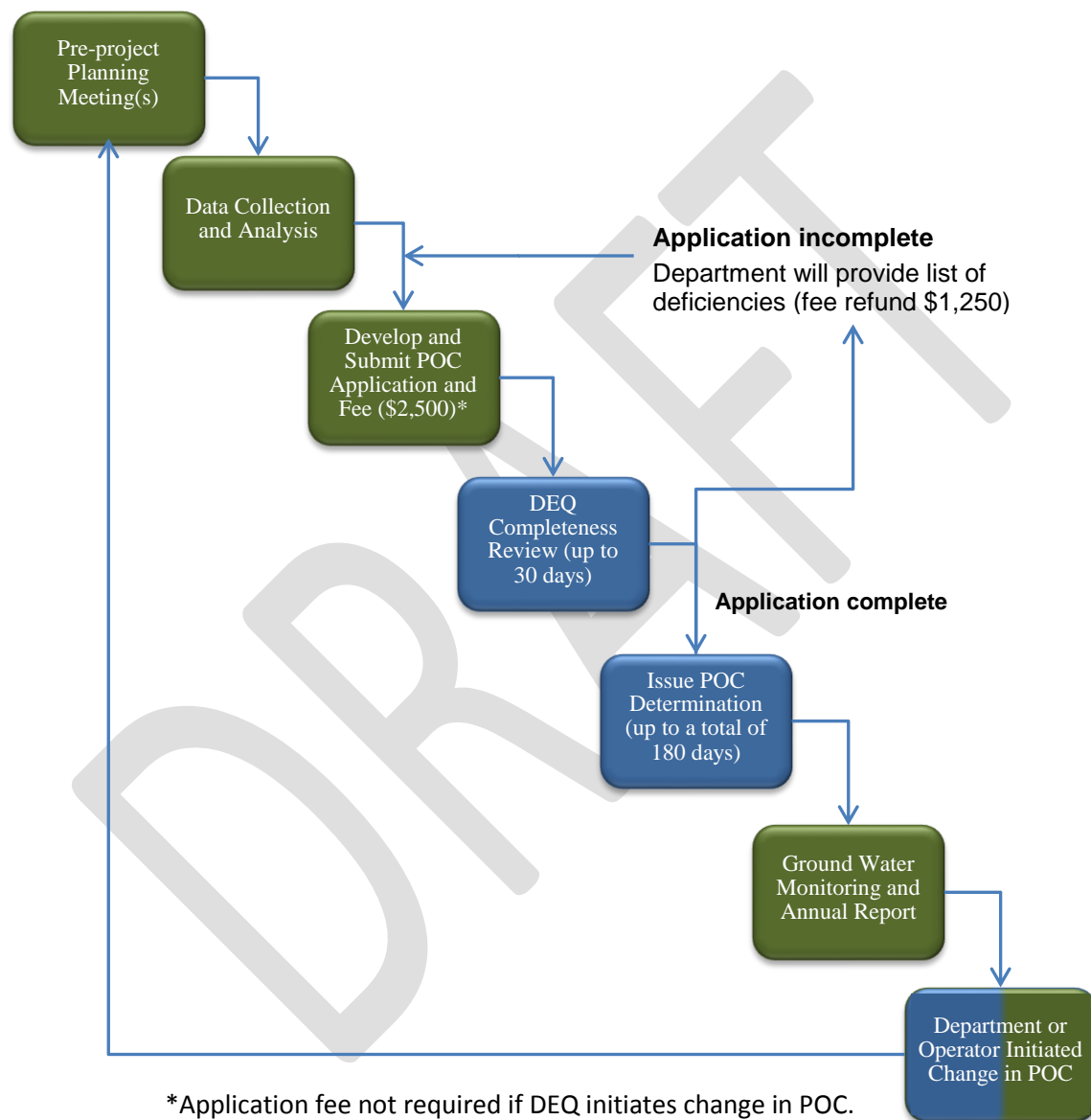


Figure 1. Application process.

5 Preproject Planning Meeting

It is highly recommended that the mine operator interested in requesting a POC contact the appropriate DEQ regional office to set up a pre-application consultation meeting. See Figure 2 for regional office administrative areas and contact information. This meeting is an opportunity for the applicant to present and discuss the proposed mine project, data collection and analysis needs, hydrogeological conceptual site model, proposed BMPs, any unique or site-specific circumstances that should be considered in the POC development, and the applicant's recommendation for POCs. This is an informational meeting that is intended to assist the applicant in preparing a POC application. DEQ will make no decisions regarding POCs at this time. However, DEQ staff will answer questions regarding the application review process and may make recommendations to the applicant regarding application content in light of the site-specific information presented.

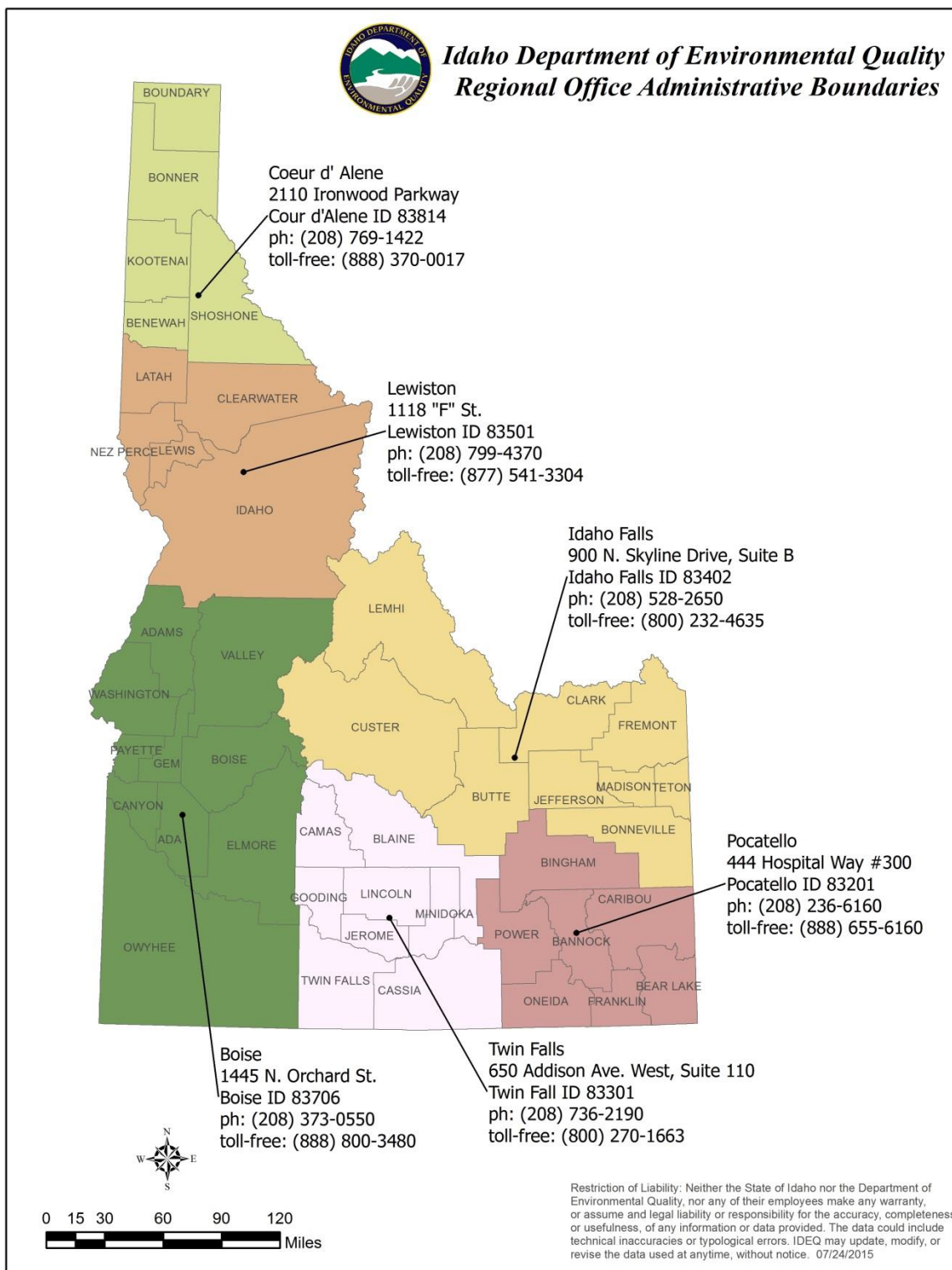


Figure 2. DEQ regional office administrative boundaries and contact information.

6 Data Collection and Analysis

6.1 Data Collection

The mine operator is encouraged to begin collecting site-specific data as early as possible. The POC application requires site-specific data on the geologic, hydrogeologic, and surface water environments.

Components of this data collection typically involves significant effort and cannot be completed without extensive field investigation activities. For example, adequate characterization of natural or site background ground water quality usually requires full year quarterly or seasonal monitoring. The mine operator must provide site background ground water quality data that represent ground water quality prior to initiation of mining activities as part of the POC application. The results of the site ground water quality monitoring will be used to determine the parameters and frequency for water quality monitoring during and after mining.

The number of samples necessary to determine baseline conditions will be decided on a case-by-case basis consistent with the *Statistical Guidance for Determining Background Ground Water Quality and Degradation* (DEQ 2014).

Additional baseline ground water quality information may be available from the IDWR Statewide Monitoring Network, United States Geological Survey (USGS), Idaho State Department of Agriculture (ISDA), or DEQ. For wells installed prior to the POC determination, it is recommended that mine operators prepare a work plan that DEQ can review and approve for the development of background water quality levels for a new mine site.

6.2 Data Analysis

The geologic and hydrogeologic data should be analyzed to develop a site conceptual model. An accurate site conceptual hydrogeologic model is fundamental to understanding the fate and transport of contaminants of concern in the ground water. The concentration, volume, and physical and chemical characteristics of contaminants of concern estimated from the mining activity should be simulated with fate and transport models using the aquifer and geologic parameters of the site conceptual model derived from the site-specific data collection efforts. The results of the modeling efforts will serve as the basis for determining the POC locations.

The specific information that will be reviewed by DEQ when setting the POC locations is discussed in section 7.

6.3 Best Management Practices Evaluation

The mine operator seeking a POC should evaluate BMPs as part of the POC application to the DEQ. The site conceptual model should be used to evaluate different mining BMPs and best practical methods (BPMs) in order to select the most appropriate strategies for protecting ground water resources, to the maximum extent practical. The BMP determination report may be presented to DEQ in an alternatives evaluation format. The report should include the following:

- Regional setting and land uses

- A summary of surface water bodies, geology, and hydrogeology within a 1-mile radius of the mine
- A discussion of existing and projected beneficial uses of ground water at the mine and surrounding properties
- A detailed alternatives analysis of operational and post-mining BMPs and BPMs for all potential ground water contaminant sources including, but not limited to, ore stock piles, waste rock storage areas, pits, stormwater retention ponds, sediment basins, and haul roads
- Recommendations for BMPs and BPMs that will be used at the mine

An environmental impact statement alternatives analysis may substitute for the BMP evaluation.

BMPs that may be applicable as additional preventive measures or as operational practices for surface mining projects may be found on the IDL website under BMPs for mining in Idaho, available at www.idl.idaho.gov/mining. Other BMPs that may be relevant can be found at www.deq.idaho.gov/media/458917-compendium_report_2003_entire.pdf, and www.deq.idaho.gov/water-quality/wastewater/stormwater. Additional BMPs for mining in Idaho are expected to be developed from mining projects.

7 Point of Compliance Application Information

7.1 Submittal Package

Mine operators requesting a POC determination must provide a written application accompanied by a fee of \$2,500. The mine operator should provide the appropriate DEQ regional office three hard copies and one electronic version (PDF) of the application. The applicant should provide sufficient information to support and demonstrate that there will be no injury to current or projected future beneficial uses of ground water outside of the mining area and no violation of water quality standards to any interconnected surface waters. Materials submitted need to be legible and map features clearly labeled.

7.2 Required Elements

The application should be a complete, stand-alone document with all referenced materials included. It also must include the following information in sufficient detail to allow DEQ to establish the POC(s):

1. Name, location, and mailing address of the mine operation

The name, mailing address, and a physical description of the location of the mine must be provided.

2. Name, mailing address, and phone number of the mine operator

The current mailing address and phone number of the mine owner must be provided. If this information changes, the mine operator must notify DEQ.

3. Landownership status of the mining operation (federal, state, private, or public)

For state and federal lands or public leases, the lease number(s), agency responsible for land management and/or the lease, number of acres, and the planned activity must be provided. Additional information such as use permits or other agreements must also be described.

The operator should include the contact information for all federal and state entities with authority over the mine.

Private landownership status can be found in the county assessor's offices. Some counties have information available online. Information regarding future land use may also be available at the county offices and useful for evaluating future projected beneficial uses (discussed later).

4. Legal structure (corporation, partnership, etc.) and residence of mine operator

The company organization, type of business, headquarters address, subsidiaries, and information regarding operators that are under contract must be provided.

5. Legal description, to the quarter-quarter section, of the location of the proposed mining operation

The legal description of the proposed mine including township, range, sections, and quarter-quarter sections must be provided. Legible maps of the physical layout of the mine vicinity should be included.

6. Evidence the mine operator is authorized by the Secretary of State to conduct business in the State of Idaho

Businesses must file a certification of existence with the Secretary of State and other requirements under Idaho Code Title 30, Corporations, and Title 53, Partnerships. Certifications are publicly available at

www.accessidaho.org/public/sos/corp/search.html?ScriptForm.startstep=crit.

7. A general description of the operational plans from construction through final reclamation

Activities that must be described include construction, mine operation, and reclamation. Construction may include road building, utility installation, fuel storage tanks, excavation, pits, ponds, pond lining, dewatering system and water storage, overburden and waste rock stockpiles, buildings, and other facilities, including approximate dimensions. The type of reserve extraction and processing must also be described. The description should outline timelines or phases of construction and mine operation, areas to be backfilled and the type of material, as well as storage areas, structure removal and disposal, contouring, and seeding. A summary table for mine disturbance areas in acres for the major constructed features for each lease or parcel is helpful in understanding the magnitude of the operation.

8. Preconstruction topographic site maps or aerial photos extending at least 1 mile beyond the outer limits of the mining area showing location and extent of key features listed below

A preconstruction topographic site map or aerial photo, preferably both, extending at least 1 mile beyond the outer limits of the mining area must be provided. Maps must

be legible with features clearly labeled for both existing and to-be-constructed features such as roads, buildings, streams, stormwater ponds, mine, and mine ancillary structures (mill, tailing stockpiles, tailing ponds, offices, sheds, etc.). The maps must have a scale reference, north arrow, legend, and date.

a. Wells, perennial and intermittent springs, adit discharges, wetlands, surface waters and irrigation ditches

All wells, springs, adit discharges, wetlands, surface waters, and ditches within the mining area and 1 mile beyond must be plotted and labeled on a map. Most wells drilled since 1987 can be found on the IDWR website (www.idwr.idaho.gov/Apps/appsWell/WCInfoSearchExternal). Older or recently drilled wells may need to be located through an IDWR Regional Office or by an on-the-ground search.

Springs can be located from a site survey, maps, and remote sensing images. A description of each spring should include the discharge rate and any other pertinent information.

Streams (including intermittent), rivers, canals, wetlands, and ditches must be located on the preconstruction maps. All structures, diversions, water impoundments, and features associated with mining operations should also be located on the map.

If the mine site is within a 100-year flood plain, that information must be provided. Federal Emergency Management Agency maps delineate 100-year flood plain areas and are available at www.fema.gov.

The 100-year flood plain designations may also be available at county offices.

b. All public and private drinking water supply sources within 1 mile of the mining area

In addition to IDWR's well log search, DEQ's Drinking Water Program or Source Water Assessment Program may provide public drinking water source information: <http://mapcase.deq.idaho.gov/swa/>. Field reconnaissance may also be necessary to determine if other nonrecorded wells or surface water intakes exist in the area.

c. All service roads and public roads

All existing roads and proposed mine-related roads must be located and labeled on the map.

d. All building and structures within 1 mile of the mining area

All existing buildings and structures—such as sheds, fences, pipelines, power lines, bridges, diversions, culverts, adits, drain fields, and septic tanks—must be located and labeled on the map.

e. All special resource waters within 1 mile of the mining area

Not currently applicable. The special resource waters designation was removed from Idaho statutes and rules in March 2012.

- f. All Clean Water Act §303(d)-listed streams, and their impairments, within 1 mile of the mining area*

Clean Water Act §303(d)-listed streams are water bodies that do not meet surface water quality standards for one or more beneficial uses due to one or more pollutants and are in need of a water quality improvement plan (total maximum daily load). Information on Idaho's §303(d)-listed waters can be found at http://ofmpub.epa.gov/waters10/attains_state.control?p_state=ID or www.deq.idaho.gov/water-quality/surface-water/monitoring-assessment/integrated-report.

9. A description and location of underground mine workings and adits, if available, and a description of structural geology that may influence ground water flow and direction

The Idaho Geological Survey, IDL, US Forest Service, or US Bureau of Land Management may have information related to historic mine workings and also structural geology. The USGS and area universities may have geologic maps, reports, and other information.

10. Information regarding relevant factors set forth in IDAPA 58.01.11.401.03.

See section 8 for a list of potentially relevant factors that DEQ will consider when setting the POC. This information should be submitted in sufficient detail to support the mining area's hydrogeologic conceptual site model and the POC determination. Insufficient information under this item most often results in an incomplete application.

11. A proposed point of compliance or points of compliance

The operator will submit proposed locations for POC(s) for each potentially impacted aquifer. The department will review the application and consider the proposed POC location(s) in light of the information submitted and any other information that may be available. However, the final decision on the location and number of POCs will be determined by DEQ.

8 Application Review and Determination

DEQ will make a final POC determination within 180 days after receiving a complete application. This section details the criteria DEQ will use to make the determination and what information must be provided by the applicant.

8.1 Review for Completeness

The department will conduct an initial review of the POC application to determine compliance with the data requirements given in the rule. A checklist is provided in Appendix A to aid the reviewers and help the applicant meet the requirements. The department will provide written notice to the mine operator of application completeness within 30 days (IDAPA 58.01.11.401.02.b). If DEQ determines the application is incomplete, the department regional administrator will notify the mine operator in writing and will provide a list of deficiencies. DEQ will also refund half of the application fee.

8.2 Analysis for Setting Points of Compliance

The POC determination is driven by the requirements set forth in IDAPA 58.01.11.401.03. This section quotes the applicable information from the rule (in italics) then explains the DEQ analysis and required information from the applicant.

The Department's determination regarding the point(s) of compliance shall be based on an analysis and consideration of all relevant factors including, but not limited to:

a. The hydrogeological characteristics of the mining area and surrounding land, including any dilution characteristics of the aquifer and any natural attenuation supported by site-specific data

The department's hydrogeological characteristics analysis will consider the mining area soils, geology, hydrology, and hydrogeology, including dilution and natural attenuation characteristics if supported by site-specific data. (DEQ recommends that applicants provide figures depicting the above-listed features to aid in the regulatory analysis.) The overall goal is to acquire an understanding of the area's characteristics that control the fate and transport of any potential naturally occurring contaminants in ground water resulting from mine activities and decrease the uncertainty associated with the parameters used to develop the hydrogeological conceptual model.

The analysis will consider soils based on thickness, organic matter content, textural class, bulk density, permeability, available water holding capacity, and cation exchange capacity for each soil type. Water that has percolated through waste rock can seep into underlying soil or emerge as seeps then enter downgradient soil. Soil can act as a filtration system for attenuating chemical contaminants in water or remove microbial organisms or soil can reduce the volume of water coming into contact with contaminant sources. The Natural Resources Conservation Service and the Idaho Soil and Water Conservation Commission may provide useful soil information to the applicant when compiling soil data.

The hydraulic and agronomic properties of soil intended for use as cover material should be considered in DEQ's analysis. Test pits or borings data may be required to adequately determine soil types, thickness, and hydraulic and agronomic properties in areas with limited existing data; the test pit and boring locations, along with the areal extent of the soil, should be made available on application figures.

Geologic features to be considered include lithology, outcrops, faults, fractures, joint patterns, and bedding orientation. Exposed rock outcrops, fractures, or faulting zones can act as direct conduits for the contaminants to enter underlying aquifers without the benefit of filtration. These features may also play a significant role in ground water flow. Bedding orientation can affect aquifer heterogeneity and anisotropy, controlling flow direction and rate. The applicant should provide a geological map of the project and surrounding area and a description of all key geologic features that may affect ground water recharge, discharge, flow, and contaminant transport.

Hydrologic characteristics to be considered include precipitation; all surface water bodies, including stormwater basins, sediment basins/ponds, and channels; and any surface water/ground water interactions. The amount and timing of precipitation can significantly affect ground water recharge, aquifer dilution capabilities, flow directions, and contaminant

transport. Within mountainous regions of Idaho, elevation and aspect play a large role in annual precipitation amounts. Surface water bodies can provide recharge to underlying ground water systems or provide a point of discharge. Recharge to and discharge from ground water systems may both occur in the same surface water body dependent on location and time of year. The applicant should provide all applicable data on the hydrologic characteristics of the site. DEQ will analyze the data in relation to potential subsurface contaminant fate and transport.

The department's analysis will focus on the aquifers that may be affected by the mine activity. The analysis will consider each aquifer's areal extent, thickness, hydraulic conductivity, boundary conditions, hydraulic gradient, current and predicted ground water flow directions (regional and local), storage potential, and ground water flow velocities. The thickness, lithology, and hydraulic properties of any overlying vadose zone will also be considered in the assessment where data are available. An analysis of any potential impacts that could affect a beneficial use of ground water within the aquifer system, any anticipated changes in the direction of ground water flow, and any potential perching units should be provided by the applicant.

In the case of a multiple-aquifer system, the parameters for that portion of the system that may be affected by the mine activities will be evaluated. A description of the extent, porosity, hydraulic conductivity, and thickness of any confining layers should be provided by the applicant and will be considered in DEQ's analysis.

Ideally, hydraulic conductivity should be determined on a site-specific basis through appropriately designed and conducted aquifer tests. However, hydraulic conductivity and porosity may be determined from published values for the respective lithology if site-specific data are not available.

Resources for hydrogeologic information include published hydrogeologic investigations conducted by various agencies such as DEQ, IDWR, USGS, ISDA, and the Idaho Water Resources Research Institute. University thesis projects may also provide information.

Monitoring wells should be installed to adequately characterize ground water flow direction and ground water quality within the aquifers that may be impacted by mining.

Ground water flow and contaminant transport models can be useful in predicting various scenarios, provided the input parameters are reasonable for the hydrogeological conditions. Tracer or dye studies may be useful in some projects to determine the ground water velocity and direction of ground water flow.

b. The concentration, volume, and physical and chemical characteristics of contaminants resulting from the mining activity, including the toxicity and persistence of the contaminants

Mining activities tend to mobilize and concentrate naturally occurring constituents. The applicant should provide an analysis of predicted concentrations that will result from the mine activity from all source materials and source areas. Typically, a contaminant transport model is used to help describe and predict the future concentrations from the proposed mine activities. Also, a mine operator using a contaminant fate and transport model may use those naturally occurring constituents that have numeric standards (58.01.11.200) to screen out

possible constituents for analysis (58.01.11.150.01). The application should describe the contaminants resulting from the mining activity for each potentially impacted aquifer.

c. The quantity, quality, and direction of flow of ground water underlying the mining area

Published regional and local hydrogeological studies and models may provide maps indicating ground water flow directions in the area; however, site-specific ground water conditions should be obtained for the same aquifer. Monitoring wells should be installed to adequately characterize ground water flow directions for each potentially impacted aquifer in the mining area. In general, a minimum of three wells in a triangular configuration that intercept ground water can be used to calculate site-specific ground water flow direction. Ground water flow direction may vary by aquifer, so multiple flow directions may be present in an area.

d. The proximity and withdrawal rates of current ground water users

The proximity of current ground water users can be determined by plotting and labeling existing well locations on the map; the map must have a scale to determine distances to these current users of ground water. The IDWR well log database can be searched for well logs and approximate location. Newer well logs may have GPS coordinates for location; however, most well locations are given by quarter sections. A field survey reconnaissance may be necessary to accurately locate existing wells. Public water supply withdrawal rates can be found by contacting the system operator or the Public Water System Switchboard through DEQ's Drinking Water Program at www.deq.idaho.gov/water-quality/drinking-water/pws-switchboard.

Withdrawal rates for private wells are generally allowed up to 13,000 gallons per day for domestic purposes, which include irrigating up to 0.5 acres of land or up to 0.04 cubic feet per second for other uses. The diversion rate may result in larger volumes if a water right has been issued. Water rights can be found on the IDWR website at www.idwr.idaho.gov/apps/ExtSearch/WRAJSearch/WRADJSearch

e. A prediction of projected future beneficial uses

Current and historic land use, depth to ground water, surface water bodies, springs, ground water temperature, site background ground water quality, mine location, elevation, vegetation, infrastructure, and any historical significance in the area are important factors to consider in predicting future beneficial uses of ground water.

Other factors such as climate, soil, proximity to infrastructure, recreational opportunities, and transportation and utility corridors may also influence the prediction of population and/or land use trends that may determine beneficial uses.

Landownership records can provide information regarding historic land use activities and may be available from the local county assessor's office. County offices may be able to provide information regarding projected future land use.

f. The availability of alternative drinking water supplies

In the event that existing drinking water supplies become impaired as a result of the mining activity, providing alternate drinking water supplies may be required. The quality and quantity of other nearby wells, deeper aquifers below the mine activity, surface water sources, springs, and feasibility of treatment that may be required for compliance with US Environmental Protection Agency Drinking Water Standards will need to be examined. The feasibility of providing treated water from other areas or bottled water may also need to be explored.

g. The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water

The mine operator must provide site background ground water quality data prior to initiating mining activities. The results of the site background ground water quality monitoring will be used to determine the parameters and frequency for water quality monitoring during and after mining. The number of samples necessary to determine site background conditions will be decided on a case-by-case basis consistent with the *Statistical Guidance for Determining Background Ground Water Quality and Degradation* (DEQ 2014).

Existing ground water quality will be discussed during the recommended pre-project planning meeting (see section 5). Additional baseline ground water quality information may be available from the IDWR Statewide Monitoring Network, USGS, ISDA, or DEQ. For wells installed prior to the POC determination, it is recommended that the mine operator prepare a work plan for DEQ to review. The work plan should describe how the mine operator proposes to determine background ground water quality for a new mine site.

h. Public health, safety, and welfare effects

The mine operator must identify any potential public health, safety, and welfare effects not addressed elsewhere in the POC application.

8.3 Coordination with Other State or Federal Agencies/Public Notice

DEQ will coordinate with and seek recommendations from other state or federal agencies that have regulatory authority over the mining activities such as the US Bureau of Land Management, US Forest Service, and IDL. DEQ may provide public notice and an opportunity for public comment prior to setting or changing the POCs.

8.4 Setting the Points of Compliance

DEQ will establish the POC(s) within a total of 180 days from receipt of a complete application (30 days to determine completeness and 150 days for the determination) by issuing a determination letter containing POC locations and any other monitoring locations deemed necessary by the department to protect beneficial uses outside of the mining area. The determination letter will be signed by the appropriate DEQ regional administrator. DEQ will also issue a public notice after setting the POCs.

9 Ground Water Monitoring and Reporting

9.1 Requirements

Ground water monitoring and reporting are required whenever DEQ sets a POC. Monitoring must be designed to represent both background ground water quality that has not been affected by the applicant's mining activities and the ground water quality passing the POC.

According to IDAPA 58.01.11.401.04:

The Department shall require ground water monitoring and reporting whenever the Department sets the point(s) of compliance. The Department shall not require ground water monitoring that duplicates ground water monitoring required by other state or federal agencies as long as the mine operator provides the data to the Department.

- a. A ground water monitoring system required under Subsection 401.04 shall be designed to:
 - i. Represent the quality of background ground water that has not been affected by the mining activity; and
 - ii. Represent the quality of ground water passing the point(s) of compliance in order to determine compliance with ground water quality standards or effectiveness of best management practices.
- b. When practicable, indicator monitoring wells or other devices may be required. Such indicator wells and other devices shall not be used to determine compliance with the ground water quality standards, but instead may be used to evaluate modeling results, to predict the quality of ground water at the point(s) of compliance, or to determine the effectiveness of best management practices.
- c. All monitoring wells shall be constructed (well depth, well screen size, well screen interval, gravel pack, etc.) and developed so that ground water samples represent the quality of ground water that is relevant to current and future beneficial uses.

In some instances, such as at a new mine, a background monitoring location and the POC may be the same location. A ground water monitoring plan for the POCs and any required indicator wells must be approved by DEQ. The monitoring plan should include, but is not limited to, a sampling and reporting schedule, analyte list, well sampling procedures, and a description of the process for developing site background concentrations. If new wells are necessary, a well installation plan describing well locations, drilling methods, anticipated well depths, construction details, and development methods will also need to be approved by DEQ.

Due to the variability in site characteristics, ground water monitoring for each mine site will be considered on a case-by-case basis considering information submitted in the POC application. In addition to hydrogeologic and soil characterization of the mine site, the site background ground water quality is necessary to determine the parameters and frequency of ground water quality monitoring during mine operation.

The purpose of a ground water quality monitoring system is to determine the effects of the mining operation on ground water quality. The mine operator must provide a ground water quality monitoring system that adequately protects ground water quality and a location map showing sample sites. All ground water monitoring activities should be conducted in accordance with a DEQ approved quality assurance project plan. Site-specific factors—including site hydrogeology, soil conditions, ground water quality of the site, and the proximity of domestic

wells, springs, and surface water—will determine the level of detail necessary for the ground water quality monitoring system.

The department shall not require ground water monitoring that duplicates ground water monitoring required by other state or federal agencies as long as the mine operator provides the data to the department.

9.2 Monitoring Frequency

The mine operator shall provide a proposed frequency for water quality monitoring as part of the monitoring program. Ground water monitoring should occur prior to mining, during mining, and after mining at reasonable intervals. The monitoring frequency will need to be greater for locations that pose a higher risk of transporting contaminants to the ground water.

To establish background ground water quality conditions prior to the applicant's mining activity a minimum of 12 samples should be collected. The samples should be collected on a quarterly basis and should be collected with a sampling frequency of no greater than once a month. The collection of ground water samples on a quarterly basis for multiple quarters provides information on seasonal and annual variability.

Once mining activities begin, sampling should initially be conducted on a quarterly basis until ground water quality trends can be assessed. More frequent sampling may be required in selected wells if results indicate unanticipated changes in ground water quality. Less frequent monitoring may be adequate in wells with little variability in ground water quality. Monitoring frequency will ultimately be decided on a well by well basis.

9.3 Monitoring Constituents

The ground water quality monitoring system needs to evaluate potential changes in water quality and water levels resulting from the mine operation.

Static water level should be measured in all wells. The mine operator should provide a proposed list of constituents for water quality monitoring as part of the monitoring program. Constituents of concern are those naturally occurring constituents that may be affected by mining activities.

Initial monitoring should include major anions and cations and metals/metalloids. The mine operator is advised to contact a US Environmental Protection Agency–certified laboratory for appropriate sample containers and sampling methods. The individual constituents are described below:

- General water chemistry—nitrate-nitrite, ammonia, phosphorus, alkalinity, total dissolved solids, total organic carbon, total suspended solids
- Major anions—sulfate, bicarbonate, chloride
- Major cations—calcium, magnesium, potassium, sodium
- Metals/metalloids—arsenic, aluminum, cadmium, selenium, or other constituents of interest

The mine operator should provide a proposed list of field parameters for water quality monitoring as part of the monitoring program. When monitoring wells and springs, field

measurements should include the following minimum parameters unless rationale can be provided otherwise:

- Water temperature
- Specific conductance/total dissolved solids
- Dissolved oxygen
- pH

The following parameters may be useful to evaluate unanticipated ground water chemistry:

- Turbidity
- ORP (oxygen reduction potential)

9.4 Reporting

A data summary notice should be prepared and submitted to DEQ no later than 60 days after the sample is collected during a particular field event (e.g., monthly, quarterly, spring, fall). If the data shows a violation of ground water quality standards or an increase in constituents that exceeds predicted levels, notification must be made to DEQ within 10 days of receiving results from the analytical laboratory. The monitoring data should be submitted with the notice in an electronic data deliverable (EDD) format.

An annual report should be provided to DEQ on or before March 31 of each year for the preceding calendar year. The report is to include a summary of data collected the prior year including discussion, especially of any anomalous or unexpected data, and all available validated water quality data from all sampled wells in an electronic, easily editable format such as Excel or Access. Identification of any possible data gaps, or unanticipated changes in water quality or site conditions, should also be presented and discussed. DEQ will determine if based upon the information submitted, the operator is in compliance with ground water quality standards and the effectiveness of best management practices for the mine activities. The report should identify proposed or approved baseline/background concentrations for constituents identified as water analysis parameters using DEQ's *Statistical Guidance for Determining Background Water Quality and Degradation*. A well completion report should be included for all wells drilled during the reporting cycle.

9.5 Detection of Degradation

In the event ground water quality is degraded at the POC, DEQ may require additional monitoring, modification of mining practices, or cessation of the activity presumed to be causing ground water quality exceedances. Additional monitoring may include an increased frequency of sampling events at selected existing wells and/or installing new monitoring wells.

Modification of BMPs or BPMs may be required as modifications to the mining activity. BMPs that may be applicable as protective measures for managing stormwater and containment for mining projects may be found at DEQ regional offices or at www.deq.idaho.gov/media/458917-compendium_report_2003_entire.pdf.

10 Change in Points of Compliance/Ground Water Monitoring

A mine operator may request a change in the POC with supporting documentation citing new information regarding mining activity or site conditions. DEQ may also initiate a change in the POC if it is determined the change is necessary to prevent injury to current or projected future beneficial uses of ground water or to prevent a violation of water quality standards applicable to any interconnected surface waters. The department may also require additional or new ground water monitoring wells with a change in the POC.

DEQ may provide public notice and an opportunity for public comment prior to modifying the POC and may issue a public notice after changing the POC.

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11 References

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- DEQ (Idaho Department of Environmental Quality). *Catalog of Stormwater Best Management Practices for Cities and Counties*. Boise, ID: DEQ. Available at www.deq.idaho.gov/water-quality/wastewater/stormwater.
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- USGS (US Geological Survey). 2015. *National Field Book for the Collection of Water Quality Data*.

Glossary

Aquifer	A geological unit of permeable, saturated material capable of yielding economically significant quantities of water to wells and springs.
Beneficial Uses	<p>Various uses of ground water in Idaho including, but not limited to, domestic water supplies, industrial water supplies, agricultural water supplies, and mining. A beneficial use is defined as current or projected future uses of ground water.</p> <p>Beneficial uses for surface water include domestic water supplies, industrial water supplies, agricultural water supplies, navigation, recreation in and on the water, wildlife habitat, and aesthetics. The beneficial use is dependent upon actual use, the ability of the water to support a non-exiting use either now or in the future, and its likelihood of being used in a given manner. The use of water for the purpose of wastewater dilution or as a receiving water for a waste treatment facility effluent is not a beneficial use.</p>
Best Management Practice (BMP)	A practice or combination of practices determined to be the most effective and practical means of preventing or reducing contamination to ground water and interconnected surface water from nonpoint and point sources to achieve water quality goals and protect the beneficial uses of the water.
Best Practical Method (BPM)	Any system, process, or method that is established and in routine use that could be used to minimize the impact of point or nonpoint sources of contamination on ground water quality.
Constituent	Any chemical, ion, radionuclide, synthetic organic compound, microorganism, waste, or other substance occurring in ground water.
Contaminant	Any chemical, ion, radionuclide, synthetic organic compound, microorganism, waste, or other substance that does not occur naturally in ground water or naturally occurs at a lower concentration.
Contamination	The direct or indirect introduction into ground water of any contaminant caused in whole or part by human activities.
Degradation	The lowering of ground water quality as measured in a statistically significant and reproducible manner.
Extraction	Physical removal of ore or waste rock from mineral-bearing deposits. Extraction does not include processing, which is the removal of target minerals from ores by physical or chemical methods.
Ground Water	Any water of the state that occurs beneath the surface of the earth in a saturated geological formation of rock or soil.

Hydrologic Map	A map that details geologic and hydrogeologic features including surface water features and projected ground water information such as ground water elevations.
Ground Water Quality Standard	Values, either numeric or narrative, assigned to any constituent for the purpose of establishing minimum levels of protection.
Mine Operator	Any person authorized to engage in mining activities, including without limitation those authorized by law, lease, contract, permit, or plan of organization. It does not include a governmental agency that grants mineral leases or similar contracts or permits unless the agency is engaged in mining activities.
Mine Activity	Recovery of a mineral from mineral-bearing deposits, which includes reclamation, extraction, excavation, overburden placement, disposal of tailings resulting from processing, and disposal of mineral extraction wastes, including tailings that are the result of extraction, waste rock, and other extraction wastes uniquely associated with mining.
Mining Area	The area on or within which one or more mining activities occur. The department shall determine the boundaries of the mining area as provided in IDAPA 58.01.11.401. Distinct mining activities may constitute separate mining areas.
Natural Background Level	The level of any constituent in the ground water within a specified area as determined by representative measurements of the ground water quality unaffected by human activities.
Point of Compliance	The vertical surface where the department determines compliance with ground water quality standards as provided in IDAPA 58.01.11.400.05 and IDAPA 58.01.11.401.
Remediation	Any action taken (1) to control the source of contamination, (2) to reduce the level of contamination, (3) to mitigate the effects of contaminants, and/or (4) to minimize contaminant movement. Remediation includes providing alternate drinking water sources when needed.

Appendix A. Point of Compliance Application Review Form

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Point of Compliance Application Review Form

Per IDAPA 58.01.11.401.02.a

Mine Requesting Point of Compliance Determination: _____

Date of Request: _____

- ☐ i. Name, location, and mailing address of the mining operation

Deficiencies:

- ☐ ii. Name, mailing address, and phone number of the mine operator

Deficiencies:

- ☐ iii. Landownership status of the mining operation (federal, state, private, or public)

Deficiencies:

- ☐ iv. The legal structure (corporation, partnership, etc.) and residence of the mine operator

Deficiencies:

- ☐ v. The legal description, to the quarter-quarter section, of the location of the proposed mining operation

Deficiencies:

- ☐ vi. Evidence the mine operation is authorized by the Secretary of State to conduct business in the state of Idaho

Deficiencies:

- ☐ vii. A general description of the operational plans for the mining operation from construction through final reclamation. This description shall include any proposed phases for construction, operations, and reclamation and a map that identifies the location of all mining activities.

Deficiencies:

- ☐ viii. A preconstruction topographic map or aerial photos extending at least 1 mile beyond the outer limits of the mining area identifying and showing the location and extent of the following:

- ☐ (1) All wells, perennial and intermittent springs, adit discharges, wetlands, surface waters, and irrigation ditches
- ☐ (2) All public and private drinking water supply source(s) within 1 mile of the mining area
- ☐ (3) All service roads and public roads
- ☐ (4) All buildings and structures within 1 mile of the mining area

Not currently applicable. The special resource waters designation was removed from Idaho statutes and rules in March 2012.

- ☐ (5) All Clean Water Act §303(d)-listed streams, and their listed impairments, within 1 mile of the mining area

Deficiencies:

- ☐ ix. To the extent such information is available, a description and location of underground mine workings and adits and a description of the structural geology that may influence ground water flow and direction

Deficiencies:

- ☐ x. Information regarding the relevant factors set forth in IDAPA 58.01.11.401.03, including the following:
- ☐ a. The hydrogeological characteristics of the mining area and surrounding land, including any dilution characteristics of the aquifer and any natural attenuation supported by site-specific data
 - ☐ b. The concentration, volume, and physical and chemical characteristics of contaminants resulting from the mining activity, including the toxicity and persistence of the contaminants
 - ☐ c. The quantity, quality, and direction of flow of ground water underlying the mining area
 - ☐ d. The proximity and withdrawal rates of current ground water users
 - ☐ e. A prediction of projected future beneficial uses
 - ☐ f. The availability of alternative drinking water supplies
 - ☐ g. The existing quality of the ground water, including other sources of contamination and their cumulative impacts on the ground water
 - ☐ h. Public health, safety, and welfare effects

Deficiencies:

- ☐ xi. A proposed point of compliance or points of compliance

Deficiencies:

Additional Comments: